

were stored at room temperature and were fully cured at 95°F (35°C) for 24 hours before the test. Each specimen was turned vertically, and any loose aggregate was removed by lightly brushing the specimen. Equation (1) was used to calculate the percentage of aggregate loss from the six replicated tests results.

### 3.4.3 MMLS3 Performance Test Procedure

The MMLS3 is a third-scale unidirectional vehicle load simulator that uses a continuous loop for trafficking. It is comprised of four bogies with only one wheel per bogie. These wheels are pneumatic tires that are 11.8 inches in diameter, approximately one-third the diameter of a standard truck tire. The wheels travel at a speed of about 5,500 wheel applications per hour, which corresponds to a dynamic loading of 3.3 Hz on the pavement surface. This loading consists of a 0.3 second haversine loading time and a rest period of 0.3 second. The dynamic load on the pavement surface by the MMLS3 in motion is measured by a Flexiforce<sup>®</sup> pressure sensor. The mean value of maximum dynamic loads from the four wheels is approximately 802.6 lbf. The contact area is approximately 5.27 in.<sup>2</sup> measured from the footprint of one MMLS3 wheel inflated to 101.5 psi, thus resulting in a surface contact stress of approximately 152.1 psi (Lee 2004).

The major steps in the MMLS3 test preparation are shown in Figure 3-5. Figure 3-5 (a) shows the trimmed specimen, 7.1 in. wide and 14 in. long, for the MMLS3. For chip seal testing under the MMLS3, specimens are attached to thin steel plates that are fastened to a steel base plate, as illustrated in Figure 3-5 (c). MMLS3 loading is applied after a 3-hour temperature preconditioning period at 77°F (25°C). The weight of the specimen attached to the steel plate is measured before and after the MMLS3 loading to determine the aggregate loss. The aggregate loss during the initial traffic loading in the field (normally occurring within half a day) is measured after one wandering cycle of the MMLS3 loading. Then, MMLS3 loading is applied, and the weight measurements are taken periodically over a 2-hour period (equivalent to 11,820 wheel loads) to evaluate the aggregate retention performance of the chip seal under traffic (Kim et al. 2005).

The complete MMLS3 test procedure involves the following steps (Kim and Lee 2005):